

Measures to Fight Climate Change – A Role for the Law of the Sea?

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1. Introduction

The excessive man-made greenhouse effect that is generally supposed to bring about climate change in the form of global warming has a number of different reasons. There is a balance sheet of greenhouse gas emissions and of the sequestration of these gases by sinks. The Kyoto Protocol deals with this problem by selecting, in order to reduce the greenhouse gas concentration in the global atmosphere, a particular part of the problem, namely emissions of greenhouse gases from the territory of the developed industrial States listed in Annex I to the UNFCCC and sinks which function due to measures taken by these States. These emissions and activities are a significant contribution to the problem of climate change, but not the only one.

In particular the oceans of the world have remained outside the purview of the KP. However, these oceans as well as activities carried out on the oceans have diverse impacts on the greenhouse gas concentrations in the atmosphere, and thus on the phenomenon of global warming. On the other hand, the phenomena of global warming have an impact on the biological processes taking place in the oceans. The interface between the oceans and the atmosphere is complex. Not all chains of causation it involves are yet fully understood. The lawyer interested in creating or understanding a legal regulation of a natural phenomenon has to ask where there is a human impact on these chains of causation and where or how law can best regulate this human impact.

The problems to be dealt with in this paper are, thus, the following ones:

- What are the specific chains of causation we have to address concerning the role of the oceans within the global natural processes which determine the world's climate?
- Which are the specific human activities which have to be addressed?
- Which are the particular rules pertaining to the law of the sea or to other areas of the law which regulate the activities in question?

The natural processes which are relevant for our purposes are the following:¹

The oceans are the major carbon sink on earth;² that means that they absorb more carbon dioxide than they emit, thus significantly reducing the overall carbon dioxide content of the atmosphere. The ensuing question is whether and how this process can be influenced (positively or negatively) by human activity and whether there are legal standards for such activity. The legal standards might be influenced by an answer to the question whether the absorption of CO₂ into sea waters – desirable as it may be because of its positive climatic effect – also entails negative environmental consequences.

Secondly, capture and storage of CO₂ produced by human activities is an important option for avoiding its emission into the atmosphere. The deep sea is one of the storage sites currently under discussion. Would such deep sea storage be compatible with applicable international legal rules? If so, under what conditions?

Third, human activities in sea areas (shipping, oil production) cause greenhouse gas emissions. Are there legal rules limiting such emissions? As in the case of many new problems facing the international community, there is a problem of organising the reaction of that community to the problem in question. There is a proliferation of international institutions. Thus, it has to be asked which parts of the international administrative set-up (international organisations, treaty bodies) contribute to the solution of the problem.

¹ See S. N. Krohn, Twenty Thousand Leagues Under the Sea: On the Legal Admissibility of Strategies to Mitigate Climate Change by Ocean Sequestration, in: M. Bothe/E. Reh binder (eds.), *Climate Change Policy*, 183-216, at 185 *et seq.* (2005); R. Rayfuse/M. G. Lawrence/K. M. Gjerde, *Ocean Fertilisation and Climate Change: The Need to Regulate Emerging High Sea Uses*, 23 *International Journal of Marine and Coastal Law* 297-326 (2008).

² Krohn (note 1), at 185.

The UN General Assembly has dealt with the problem within its general consideration of “Oceans and the Law of the Sea”.³ The *omnibus* resolution adopted under this title provides an interesting overview of disparate international activities in this field, but it would be an exaggeration to speak, in this regard, of coordination or guidance by the GA. Other UN organs also have addressed the problem, in particular UNEP.⁴ Various UN specialised agencies⁵ deal with various aspects of the problem, and so do certain treaty bodies.⁶ Specific coordinating bodies have been created between these and other institutions.⁷ In practice, the central institution is the IMO. The coordination between these institutions and their activities is problematic despite the fact that there are usages of coordination. There is also the question of the relationship between various relevant treaty regimes, in other words a specific case of the fragmentation of international law.

2. The Oceans as Carbon Sink – Protection of Their Functions

The absorption of carbon dioxide by the sea is due to two different processes, called solubility pump and biological pump.⁸ As to the former, there is a rapid transfer of carbon dioxide from the atmosphere into the water through wave action which is effective down to a depth of approximately 100m. This solubility of CO₂ increases with decreasing water temperature and vice versa. This means that the rise of temperatures due to climate change negatively affects the function of the sea as a carbon sink. This is a kind of self-acceleration of the greenhouse effect.

³ GA Res. 63/111 of 5 December 2008.

⁴ United Nations Environment Program.

⁵ UNESCO, IMO (International Maritime Organisation).

⁶ Examples are the Conferences of the Parties to relevant treaties, such as the London Dumping Convention and the Convention on Biological Diversity (CBD), see below.

⁷ A central role is played by the IPCC (Intergovernmental Panel on Climate Change). As to relevant aspects of marine science, there is GESAMP (Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection).

⁸ Krohn (note 1), at 186.

The latter effect, the biological pump, is due to phytoplankton activity similar to the carbon absorption by plants on land. In the upper layers of the sea, phytoplankton converts carbon dioxide into organic carbon through the effect of sunlight and inorganic nutrients. About 20% of this organic carbon is transported into deeper waters and thus, at least for a long time, withheld from the atmosphere. That process, too, may be affected by climate change. Higher wind speeds triggered by climate change affect the vertical transportation of water masses, thus bringing more sunken organic carbon up, which diminishes the capacity of higher water layers to absorb CO₂.⁹

As a result of the phenomena just described, as newer studies show,¹⁰ the function of the ocean as carbon sink has been seriously impaired.

The relevant legal rules which could contribute to limit this negative trend must address the temperature change. They belong to climate change law, i.e. the UNFCCC regime, or to the law relating to air pollution. The law of the sea contains no rules on these phenomena. But it does possess certain rules for some other natural processes that are relevant and that we have now to address.

3. The Oceans as Carbon Sink – Enhancing Their Function

The negative developments just described obviously raise the question how the function of the oceans as carbon sink could be preserved or even enhanced. A measure under discussion in this respect is to push the biological pump by seeding iron particles as inorganic nutrient into the sea (ocean fertilization). This would then increase phytoplankton activity, which leads to more CO₂ being absorbed.¹¹ The overall environmental effects of such a procedure are, to say the least, highly controversial.¹² Some scientists doubt whether the intended result could be

⁹ Science Daily, available at <<http://www.sciencedaily.com/releases/2009/02/09216092937.htm>>, last visited 16 November 2009.

¹⁰ Science Daily, id.

¹¹ Krohn (note 1), 188 *et seq.*; Rayfuse/Lawrence/Gjerde (note 1), at 302 *et seq.*

¹² Wikipedia, Iron fertilization, available at <http://en.wikipedia.org/wiki/Iron_fertilization>.

achieved at all at a price which is commercially feasible,¹³ so the positive effects claimed would be an illusion. Other experts point to possible negative consequences like harmful algal blooms, deep water oxygen depletion, explosions of jellyfish populations or severe disturbances of the food chain of whales.

The procedure also raises a number of legal questions. The first problem to be addressed is whether the Law of the Sea Convention provides an answer to them. An important aspect is whether ocean fertilization would belong to the freedom of the high seas. The enumeration of the freedoms in Article 87 UNCLOS is not exhaustive.¹⁴ Other activities are also admissible, not only traditional ones like the use for military purposes, but also new ones, always provided that they are exercised with due regard for the interest of others. A difference may consist in the fact that the traditional freedoms are egoistic activities, while ocean fertilizing could be considered as an altruistic activity, undertaken in the interest of preserving the global climate. This difference invites an *a fortiori* argument for the admissibility. But the altruistic character of the activity cannot lay aside environmental concerns.

A further question is whether ocean fertilization carried out by one State in the EEZ of another is admissible. It requires the consent of the coastal State if it is an “activity for the economic exploitation ... of the zone” in respect of which the coastal State has sovereign rights (Art. 56 (1)(a) UNCLOS). As ocean fertilization is an activity which exploits certain properties of living organisms found in the waters of an EEZ, one can well argue that it is a right reserved to the coastal State.

Turning to special treaty regimes, the Kyoto Protocol does not provide an incentive to use ocean fertilization under its mechanisms. National activities related to sinks can only be credited to a State’s greenhouse gas reduction commitment in the case of sinks on land.¹⁵

¹³ Will Ocean Fertilization to Remove Carbon Dioxide from Atmosphere Work?, Science Daily, 10 April 2003, available at <<http://www.sciencedaily.com/releases/2003/04/030410073330.htm>>; Ocean Fertilization ‘Fix’ for Global Warming Discredited by New Research, Science Daily, 30 November 2007, available at <http://www.sciencedaily.com/releases/2007/11/071129132753.htm>.

¹⁴ C. E. Pirtle, Military Uses of Ocean Space and the Law of the Sea in the New Millenium, 31 Ocean Development & International Law 7-45, at 15 (2000).

¹⁵ Art. 3 (3) Kyoto Protocol (KP).

The first relevant treaty regime is that of the (London) Dumping Convention of 1972¹⁶ and the Protocol thereto of 1996.¹⁷ As matter is brought into the sea, this could constitute “dumping” prohibited under Art. 4 of the London Protocol. However, the definition of dumping excludes¹⁸

“placement of matter for a purpose other than mere disposal thereof, provided that such placement is not contrary to the aims of this Protocol ...”

Ocean fertilization is not a mere disposal of the particles. But is the “placement” of those iron particles contrary to the aims of the Dumping Protocol? This is a difficult question, and the debate within the competent organs established under the Dumping Convention has been somewhat controversial. It would appear that a placement is contrary to the aims of the Protocol if it has adverse environmental effects¹⁹ which are similar to those of waste disposal. If this is a correct assumption, the ensuing question is what the environmental effects of ocean fertilization, considered in an overall balance sheet, are. Here, we encounter a situation of uncertainty. A plausible reaction to that uncertainty is to apply the precautionary principle and not to undertake such fertilization until the environmental consequences are better known. In this sense, the Meeting of the Contracting Parties to the London Convention and the London Protocol (MOP LC-LP) adopted a resolution to the effect that no ocean fertilization activities should take place, except research.²⁰

¹⁶ London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 29 December 1972, 1046 UNTS 120, 11 ILM 1294 (1972).

¹⁷ Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 7 November 1996, 36 ILM 1 (1997).

¹⁸ See Rayfuse/Lawrence/Gjerde (note 1), at 313.

¹⁹ Cf. Rayfuse/Lawrence/Gjerde (note 1), at 316.

²⁰ Res. LC-LP.1 (2008) of 31 October 2008; against this exception *de lege lata* Rayfuse/Lawrence/Gjerde (note 1), at 316 *et seq.*, but for a regulated exception in the same sense *de lege ferenda* at 320 *et seq.*

(The Meeting)

...

Noting that knowledge on the effectiveness and potential environmental impacts of ocean fertilization is currently insufficient to justify activities other than legitimate scientific research;

...

3. *Agree* that in order to provide for legitimate scientific research, such research should be regarded as placement of matter for a purpose other than a mere disposal thereof ...

4. *Agree* that scientific research proposals should be assessed on a case-by-case basis using an assessment framework to be developed by the Scientific Groups under the London Convention and Protocol;

5. *Agree* that the aforementioned assessment should include, *inter alia*, tools for determining whether the proposed activity is contrary to the aims of the Convention and the Protocol;

This is a pragmatic approach to the problem. It would indeed be a disproportionate and therefore incorrect application of the precautionary principle if Art. 4 of the Protocol were interpreted as excluding all research. The resolution is not legally binding, it does not dispose of the legal question, but it may pave the way for such a solution. In this sense, referring in particular to the said resolution, an assessment made by the German Ministry of Education and Research has come to the result that an experiment conducted in a small area of the Southwest Atlantic is indeed lawful as it conforms to all relevant scientific standards of precaution.²¹

The Convention on Biological Diversity (CBD)²² is another relevant treaty regime. According to Art. 4 CBD the Convention applies not only to elements of biodiversity situated on the territories of the contracting parties, but also to all activities undertaken under the jurisdiction or control of the parties regardless of where their effect takes place. Activities undertaken by or under the control of Contracting Parties at sea thus fall within the jurisdictional scope of the Convention. As ocean

²¹ R. Wolfrum, Zusammenfassung der Gutachten zum deutsch-indischen LOHAFEX-Experiment im Südwestatlantik sowie abschließendes Votum, available at <http://www.bmbf.de/_media/press/Univ_Heidelberg_zu_LOHAFEX.pdf>.

²² 5 June 1992, 1760 UNTS 79; 31 ILM 818 (1992).

fertilization has an impact on biological processes taking place in the oceans, the Conference of the Parties to the CBD has indeed dealt with the question, generally in the same sense as the MOP LC-LP, but in a more restrictive way, as it would allow research only in the coastal waters of a State Party.²³ The expert advice given to the German Ministry of Education and Research just mentioned stresses the obvious fact that this resolution is not binding and that therefore the said restriction is not mandatory. The restriction is difficult to justify as the reasons for abstaining from, or engaging in, research on ocean fertilization are not different whether the research takes place inside or outside the territorial sea.

The relevant UNGA resolution²⁴ is also not binding. It takes note of the two resolutions just mentioned without addressing the difference between the uttering of the CBD and that of the LC-LP treaty bodies.

Turning to regional treaties on the protection of the marine environment, we must first mention the strictest regime, namely that of the Antarctic.²⁵ This is all the more appropriate as the processes which are at issue, namely the increase of phytoplankton activity, are of particular relevance for the Southern Oceans. Art. 4 of Annex IV to the Environment Protection Protocol contains a prohibition which is slightly different from the one of the Dumping Protocol just quoted:

“The discharge into the sea of any ... chemical or other substances, in quantities or concentrations that are harmful to the marine environment, shall be prohibited.”

Whether this covers ocean fertilizing depends on whether it is considered “harmful to the marine environment” or not. Possible negative consequences have been mentioned. In the light of the existing uncertainties concerning the detrimental effects of the procedure, an interpretation in the light of the precautionary principle would suggest that it is indeed prohibited, probably also with the exception of carefully circumscribed research.

²³ Res. IX/16 C, 19-30 May 2008.

²⁴ GA Res. 63/111 of 5 December 2008.

²⁵ Protocol on Environmental Protection to the Antarctic Treaty, 4 October 1991, 30 ILM 1455 (1991).

Under the other regional conventions,²⁶ the legal situation would be similar to that under the London Dumping Protocol. All this shows that despite the fragmentation of applicable international legal rules, the actual legal rules are not necessarily different. This is due to the fact that there is some interconnection between the epistemic communities which relate to the various treaty regimes, a phenomenon which can also be observed in other contexts.²⁷

4. The Oceans as Carbon Sinks – Negative Environmental Impact?

Newer studies seem to show that an increasing absorption of CO₂ by the oceans (to the extent it is not compensated by the processes just described) causes an acidification which has negative impacts on marine life,²⁸ for instance on the food chain of corals which may lose the capacity to produce the calcium needed for their growth. In other words, an effect which is desirable from the point of view of the fight against climate change (and arguably even required by Art. 4 (1)(d) UNFCCC),²⁹ may be detrimental from the point of view of preserving marine biodiversity. There may thus be a tension between two different regulatory regimes, which by the way exists in a similar manner in relation to carbon sinks on land. The compatibility of certain land use, land use change and forestry (LULUCF) activities, which can enter into the cal-

²⁶ Protocol for the Prevention and Elimination of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft or Incineration at Sea, 16 February 1976, revised 10 June 1995, Art. 3 (4)(b), 34 ILM 1542 (1995); (OSPAR) Convention for the Protection of the Marine Environment of the North-East Atlantic, 22 September 1992, Art. 1 (g)(ii), 32 ILM 1069(1993).

²⁷ M. Bothe, Urheberrecht und “traditionelles Wissen”. Fragmentierung und Konkordanz im Völkerrecht, in: R. M. Hilty/J. Drexler/W. Nordemann (eds.), *Schutz von Kreativität und Wettbewerb*, Festschrift für Ulrich Löwenheim, at 19-30 (2009).

²⁸ Ocean Acidification, Wikipedia, available at <http://en.wikipedia.org/wiki/Ocean_acidification>.

²⁹ “All Parties ... shall ... (d) Promote sustainable management, and promote and cooperate in the conservation and enhancement, as appropriate, of sinks and reservoirs of all greenhouse gases not controlled by the Montreal Protocol, including biomass, forests and oceans as well as other terrestrial, coastal and marine ecosystems”.

culuation of net greenhouse gas emissions,³⁰ with the Biodiversity Convention is questionable.³¹ In the case of ocean biodiversity, there can be no conflict with the KP as ocean sinks are not included in the latter. But there may be some tension between the duty to promote sinks, including marine sinks, provided by Art. 4 (1)(d) UNFCCC, and the duty to preserve marine biodiversity. All this is an example of how the fragmentation of international law affects treaty making and treaty implementation. It does at times lead to tensions between different treaty regimes. But treaties are usually made, and treaty bodies produce secondary rules, with due regard to other treaty regimes. This may lead to synergistic effects³² or mutual supportiveness between treaty regimes.³³

5. The Oceans as Carbon Storage Site

Carbon capture and sequestration (CCS) has become a major issue.³⁴ The use of the oceans as carbon storage site has to be distinguished from the function of carbon sink. The latter is a natural phenomenon; the former is the artificial injection of CO₂ into deeper waters with a view to prevent these gases from getting back into the atmosphere. It may take the form of dissolution of CO₂ in deep waters or of the creation of artificial lakes of liquid CO₂ on the seabed.³⁵ The environmental consequences of this method are also controversial.

³⁰ Art. 3 (3) KP.

³¹ A. Caparrós Gass/F. Jacquemont, Biodiversity and Carbon Sequestration in Forests: Economic and Legal Issues, in: Bothe/Rehbinder (eds.) (note 1), 149-182, at 169 *et seq.*

³² See Res. IX/16 of the CBD COP, Annex II: "Indicative List of Activities by Parties to Promote Synergies Among the Rio Conventions".

³³ M. Sanwal, Trends in Global Environmental Governance: The Emergence of a Mutual Supportiveness Approach to Achieve Sustainable Development, 4 Global Environmental Politics 16-22 (2004).

³⁴ Report of the Thirtieth Consultative Meeting and the Third Meeting of Contracting Parties to the 1996 Protocol on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1971, LC 30/16, 9 December 2008, sec. 5, at 23 *et seq.*

³⁵ IPCC Special Report on Carbon Dioxide Capture and Storage, 298 *et seq.* (2005).

In respect of CCS as well, it has to be asked, too, whether it is covered by the freedom of the high seas. Some authors claim that the freedoms of the high seas generally do not comprise dumping of wastes.³⁶ Inherently harmful activities should indeed be excluded from the scope of those freedoms. The counter-argument would be, on the other hand, that CCS is not inherently harmful. Where the proposed storage site is situated in an EEZ one has to consider CCS as an “activity for the economic exploitation ... of the zone” in respect of which the coastal State has sovereign rights (Art. 56 (1)(a) UNCLOS).

The status of CCS under the KP is clear: If carbon dioxide produced on the territory of an Annex I Party (i.e. a developed country) is captured and stored somewhere, this is credited to the reduction obligation of that Party because this particular mass of CO₂ is not emitted into the atmosphere. Nevertheless, in the negotiation papers for the Copenhagen COP/MOP of UNFCCC and the KP, there were proposals to address carbon capture and sequestration as possible objects of projects financed through the Clean Development Mechanism (CDM),³⁷ i.e. projects financed by developed countries reducing CO₂ emissions or promoting sinks in developing countries where this reduction is then credited to the limitation or reduction commitment of the financing country. For the reasons indicated, it should be clear that the use of CCS for CDM purposes could only relate to carbon dioxide not originating from the financing country, otherwise a reduction would be calculated twice. The negotiation proposals went into different directions. One proposal simply excludes any CCS from CDM. Another one would at least exclude ocean sequestration. Yet a third one would open the possibility also for ocean sequestration, provided that some conditions were met. These conditions include verification, environmental impact assessment and liability, but also “issues of international law”.

In the light of the latter condition, the problem of the obligations under the Dumping Conventions would have to be solved before ocean CCS became admissible. In contradistinction to ocean fertilizing, this is mere disposal of CO₂ and therefore constitutes “dumping” within the meaning of the London Dumping Protocol and of the dumping prohibitions contained in the various regional seas regimes. This type of CO₂ dis-

³⁶ W. Graf Vitzthum, *Raum und Umwelt im Völkerrecht*, in Graf Vitzthum (ed.), *Völkerrecht*, 387-489, at 436 (4th ed. 2007).

³⁷ Ad hoc Working Group on Further Commitments for Annex I Parties under The Kyoto Protocol, FCCC/KP/AWG/2009/10/Add.3/Rev.3, 16 November 2009, paras. 5-8.

posal would therefore require an amendment to these various treaties.³⁸ Both under the London Dumping Protocol and under the North-East Atlantic (OSPAR) Convention, the problem has been solved by prohibiting the storage of carbon dioxide streams in the water column or on the seabed,³⁹ while permitting storage under certain conditions in geological formations below the seabed.⁴⁰ In the case of the London Dumping Protocol, this was achieved by an Amendment to the Protocol,⁴¹ under the OSPAR Convention by amendments to Annexes II and III.⁴²

6. Shipping as a Source of Greenhouse Gas Emissions

The CO₂ emissions from shipping are sizeable, in absolute terms they are more than double those caused by air traffic. The exact figures of emissions from shipping are somewhat controversial. According to some reports, they account for 4%, according to newer studies even 4.5%,⁴³ of the global greenhouse gas emissions. The figure given by the latest IMO study is somewhat lower.⁴⁴ In comparison, the share of air traffic is lower, only 2%. In terms of emission per transported weight shipping emissions are of course much lower than those of air traffic. Yet due to their size, they present a problem which cannot be neglected. The problem is particularly serious as a considerable growth of maritime transport is prognosticated, although it has been slowed down as a consequence of the financial crisis. This could bring the emission share

³⁸ See for the Convention for the Protection of the Marine Environment of the North-East Atlantic the Summary Record of the Meeting of the OSPAR Commission, 28 June-1 July 2004, Annex 12, at 4.

³⁹ OSPAR decision 2007/1, 25-29 June 2007.

⁴⁰ OSPAR decision 2007/2.

⁴¹ Adopted 2 November 2006, entry into force 10 February 2007.

⁴² Amendments to the Annexes are adopted by a majority decision of the Commission, but are thereafter subject to the requirement of acceptance by States Parties, Art. 15, 17 of the Convention.

⁴³ True scale of CO₂ emissions from shipping revealed, *The Guardian*, 13 February 2008, available at <<http://www.guardian.co.uk/environment/2008/feb/13/climatechange/pollution/print>>.

⁴⁴ Prevention of Air Pollution from Ships, Second IMO GHG Study 2009, Doc. MEPC 59/4/7, 6: 3.3%.

of maritime transport to much higher levels, namely in the order of 12% and 18%.⁴⁵

Emissions from shipping are not part of the national inventories of greenhouse gas emissions which are the object of the limitations imposed the KP upon the developed industrial States (Annex I States). The Protocol leaves the question of greenhouse gas emissions from shipping to the law of marine transportation, i.e. to regulation by the International Maritime Organization (IMO).⁴⁶ Various options concerning the inclusion of these emissions in a post-Kyoto treaty were considered in the preparation of CP 15 in Copenhagen, but the CP did not take any action. The Subsidiary Body for Scientific and Technological Advice (SBSTA) requested IMO to report on further work regarding these questions.⁴⁷ Thus, IMO will continue to play a major part in their regulation.⁴⁸ In 1997, the Marine Environment Protection Committee (MEPC) of IMO had started to deal with the issue. In 2000, IMO published a first report on greenhouse gas emissions from ships, and in 2009 the “Second IMO GHG Study”. If the regulation took the form of a legally binding treaty, it would be an amendment to Annex VI of MARPOL⁴⁹ which deals with pollution from ships. Such an amendment has not (yet?) been achieved. Regulatory approaches, however, are in the process of being elaborated.⁵⁰ The task is more complex than in the case of air pollution from ships caused by certain contaminants. Pollution by sulphur oxides, for instance, can be controlled by regulating the sulphur content of bunker fuels. The limitation of CO₂ emissions can be achieved by a better energy efficiency of sea transport which, however, is difficult to determine. There are a number of parameters for it: fuel consumption, weight of cargo, distance travelled. Thus, the IMO developed an indexing system containing these fac-

⁴⁵ Prevention of Air Pollution from Ships, *id.*, at 7.

⁴⁶ Art. 2 (2) KP.

⁴⁷ UNFCCC/SBSTA/2009/8, 9 *et seq.*

⁴⁸ See also UNFCCC, Ad hoc Working Group on Long-term Cooperative Action, Report, 20 November 2009, Doc. FCC/AWGLCA/2009/14.

⁴⁹ Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, 17 February 1978, 1340 UNTS 61; 17 ILM 546 (1978).

⁵⁰ Prevention of Air Pollution from Ships, <http://www.imo.org/environment/mainframe.asp?topic_id=233>, see *inter alia* IMO Assembly Res. A.963(23) of 5 December 2003.

tors.⁵¹ This is still in the trial phase. There is no obligatory or recommended formula.

As long as no obligatory or at least recommended practice for increasing the energy efficiency of sea transport exists, the question of unilateral measures by States is on the table. But measures by which State? Any State is entitled to subject the ships flying its flag to emission control measures. The EU could impose upon its members a duty to use their rights as flag States accordingly. In the absence of a universal international regulation, however, this flag State approach would deepen the problem of out flagging and of flags of convenience.

The problem of evading stringent regulation would be less acute in the case of measures to be taken by a port State, in particular if these measures were uniform throughout the EU. Redirecting cargo to ports of convenience would not be practical in this case. The first step which could be taken by port States is an offer of services which would lead to a decrease of fossil fuel consumption by ships, such as the use of, and connection to, on-shore power supply. Then the question arises, however, what type of control port States may exercise. Could it levy, for instance, a tax on the parameters just mentioned? A recent study presented at the Rostock Law of the Sea Colloquium a few weeks ago answered this question, with some hesitation, affirmatively.⁵²

7. Conclusions

The role which the oceans and activities carried out at sea play in the regulation of the global climate, i.e. in fighting, slowing or accelerating climate change, is essential. The oceans are an important, if not the most important, carbon sink. They are considered as a site of carbon storage. Activities on the seas significantly contribute to emissions causing the greenhouse effect. Not all natural processes which determine this role are entirely understood. It is no surprise that international law has so

⁵¹ Interim Guidelines for Voluntary Ship CO₂ Emission Indexing for Use in Trials, issued in 2005.

⁵² S. Schlacke, „CO₂-Reduzierung in der Seeschifffahrt: nationales Recht und Europarecht“, Vortrag anlässlich des 17. Rostocker Seerechtsgesprächs, Universität Rostock, November 2009, forthcoming. She asks whether, and denies that, such a tax would constitute an exercise of extraterritorial jurisdiction.

far only partly regulated this important aspect of the fight against climate change. Thus, a lot needs to be done.

In the fight against climate change, law needs to be innovative. The KP is innovative, indeed. However, the regulatory deficits which we encounter as to the physical role of oceans for the world's climate call for action.⁵³ Some steps taken or envisaged, however, rather look like a few well known old sins. Those who carry out activities on land which account for more than 90% of the emissions causing the greenhouse effect, tend to neglect the impact they have on the seas. Ocean fertilization is a variation of the idea of tinkering with large scale natural processes which, if considered realistically, are, however, beyond human control – it is just gambling. There is also the old myth of the unexhaustible character of the resources of the sea, long proven false as far as living resources are concerned, now revived for the seas as a storage site. Finally, those who enjoy the freedoms of the high seas have a tendency to avoid the grip of responsible national regulation. Shipping, at least ships flying flags of convenience, might try to avoid being held responsible for their contribution to climate change. This is the old challenge for the law of the sea which continues to be relevant for the most recent challenges: The global commons are for the benefit of the world community, but they must be respected and protected by that community.

⁵³ Rayfuse/Lawrence/Gjerde (note 1), at 324 *et seq.*

Law of the Sea in Dialogue

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